What is claimed is:

1. Highly absorbent composite sheet comprising a non-woven fabric substrate, solid SAP and a thermally fusible component, characterized in that:

said non-woven substrate has a bulky structure;

part of said solid SAP is contained inside said bulky structure and the rest is exposed on the surface of said non-woven substrate;

said thermally fusible component is a hot-melt adhesive;

said hot-melt adhesive forms a fibrous network; and

said fibrous network covers said solid SAP in contact with said solid SAP whereby said solid SAP is held in position.

2. The highly absorbent composite sheet of claim 1, wherein said solid SAP particles are covered with fine cellulose.

3. The highly absorbent composite sheet of claim 1, wherein the coated amount of said hot-melt adhesive is 0.2 to 10 g / m^2.

4. The highly absorbent composite sheet claim 1, wherein said hot-melt adhesive is mainly composed of ethylene-vinyl acetate copolymer and non-tacking.

5. The highly absorbent composite sheet of claim 4, wherein the content of vinyl acetate in ethylene-vinyl acetate which is the main composition of said hot-melt adhesive is 20 to 40 % by weight and the thermal fluidity rate of said hot-melt adhesive is 50 to 150 g / 10 minutes.

6. The highly absorbent composite sheet of claim 1, wherein said non-woven substrate has a bulky structure formed by a raising treatment.

7. A highly absorbent composite comprising a composite absorbent (M) which comprises a non-woven substrate, a SAP layer and a hot-melt adhesive layer forming a fibrous network covering said SAP layer, and a sheet material (N) disposed on said adhesive layer, said composite absorbent (M) and said sheet material (N) being bonded together by said hot-melt adhesive layer by an adhesive property thereof to form a composite structure (M/N).

8. A highly absorbent composite comprising two composite absorbents (M) and (M') each of which comprises a non-woven substrate, a SAP layer and a hot-melt adhesive layer forming a fibrous network covering said SAP layer, said composite absorbent (M) being laid on the other composite absorbent (M') in such manner that said hot-melt adhesive layers contact to each other and being bonded together by an adhesive property thereof to form a

composite structure (M/M').

9. The highly absorbent composite of claim 8, wherein an additional sheet material (N) interposed between said composite absorbents (M) and (M') and bonded thereto by an adhesive property of said hot-melt layers of said composite absorbents (M) and (M') to form a composite structure (M/N/M').

10. A method for manufacturing a highly absorbent composite sheet comprising the steps of:

forming a bulky structure by raising a non-woven substrate;

applying slurry containing solid SAP to the raised surface of said non-woven substrate, then removing remaining liquid and drying whereby a part of solid SAP is contained in said bulky structure and the rest of solid SAP is exposed on the surface of said non-woven substrate; and

making a hot-melt adhesive fibrous by means of a curtain spray apparatus, then blowing said adhesive in the form of a curtain and forming a fibrous network on said non-woven substrate and said solid SAP.

11. The method of claim 10, wherein said raising is performed by making the surface of said non-woven substrate with a heating roll and then after removing the surface from said heating roll, making the surface of said non-woven substrate in contact with a cooling roll.

12. An absorbent article provided with a liquid pervious topsheet, a liquid absorbent and liquid retaining absorbent member and a liquid impervious backsheet, wherein said liquid absorbing and liquid retaining absorbent member comprises said highly absorbent composite sheet obtained by the method of claim 10.

13. A highly absorbent composite sheet in which a part of solid SAP is contained in the voids of a non-woven fabric on one surface of a non-woven substrate and the rest of the solid SAP is distributed almost all over in layers as exposed on the surface of the non-woven fabric, wherein the surface of said exposed solid SAP layer is covered by a dual fibrous network of a first fibrous network of dense mesh comprising hot-melt adhesive and a second fibrous network of looser mesh positioned over and than said first fibrous network.

14. A highly absorbent composite sheet with little solid SAP coming off, in which a part of solid SAP is contained in the voids of the non-woven fabric on one surface of a non-woven substrate and the rest of the solid SAP is distributed almost all over in layers as exposed on the surface of the non-woven fabric, wherein the surface of said exposed solid SAP layer is covered by a dual fibrous network of a first fibrous network of dense mesh

comprising hot-melt adhesive and a second fibrous network of looser mesh positioned over and than said first fibrous network.

15. The highly absorbent composite sheet of claim 13, wherein the fibers of said hot-melt layer of dense mesh are finer than the fibers of said hot-melt layer of loose mesh.

16. A method for treating the surface of a highly absorbent composite sheet in which solid SAP is distributed in layers on one surface of a non-woven substrate comprising a combination of:

a first stage hot-melt treatment in which hot-melt is applied by means of a hot-melt feeding apparatus (A) for forming a first fibrous network of dense mesh comprising a hot-melt adhesive on the surface where said solid SAP is distributed and

a second stage hot-melt treatment in which hot-melt is applied by means of a hot-melt feeding apparatus (B) for forming a second fibrous network of loose mesh comprising a hot-melt adhesive than said first fibrous network.

17. The method of claim 16, wherein a first hot-melt layer of dense mesh is formed by conducting said first stage hot-melt treatment in the range of the applied amount of 0.3 g / m^2 to 2 g / m^2 and a second hot-melt layer of looser mesh is formed than said first stage hot-melt treatment by conducting said second stage hot-melt treatment in the range of the applied amount of 1 g / m^2 to 10 g / m^2.

18. The method of claim 17, wherein said first stage hot-melt treatment is conducted in the range of the applied amount of 1 g / m^2 to 10 g / m^2 and said second stage hot-melt treatment is conducted in the range of the applied amount of 0.3 g / m^2 to 2 g / m^2 so that a second fibrous network of denser mesh than said first hot-melt treatment is formed.

19. The method of claim 16, wherein as said hot-melt feeding apparatuses, two units of a curtain spray type hot-melt feeding apparatus for forming a relatively dense mesh are used in series with respect to the moving direction of said non-woven substrate.

20. The method of claim 16, wherein a first fibrous network of dense mesh is formed by using a curtain spray type hot-melt feeding apparatus as said first stage hot-melt feeding apparatus and a second fibrous network of looser mesh than the said first hot-melt layer is formed by using a spiral coat type hot-melt feeding apparatus as said second stage hot-melt feeding apparatus.

21. The method of claim16, wherein a first fibrous network of loose mesh is formed by using a spiral coat type hot-melt feeding apparatus as said first

stage hot-melt feeding apparatus and a second fibrous network of denser mesh than said first fibrous network is formed by using a curtain spray type hot-melt feeding apparatus as said second stage hot-melt feeding apparatus.

22. The method of claim 16, wherein a first fibrous network of dense mesh is formed by using a curtain spray type hot-melt feeding apparatus as said first stage hot-melt feeding apparatus and a second fibrous network of looser mesh than said first fibrous network is formed by using a line coat type hot-melt feeding apparatus as said second stage hot-melt feeding apparatus.

23. The method of claim 16 wherein a first fibrous network of loose mesh is formed by using a line coat type hot-melt feeding apparatus as said first stage hot-melt feeding apparatus and a second fibrous network of denser mesh than said first fibrous network is formed by using a curtain spray type hot-melt feeding apparatus as said second stage hot-melt feeding apparatus.